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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/675,704	09/29/2000	Nagabhushana T. Sindhushayana	PA000419	3513

23696 7590 07/23/2003

Qualcomm Incorporated
Patents Department
5775 Morehouse Drive
San Diego, CA 92121-1714

EXAMINER

ABRAHAM, ESAW T

ART UNIT	PAPER NUMBER
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2133

DATE MAILED: 07/23/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/675,704

Applicant(s)

SINDHUSHAYANA ET AL.

Examiner

Esaw T Abraham

Art Unit

2133

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 April 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5 and 6. 6) ☐ Other: _____

DETAILED ACTION

1. Claims **1 to 39** are presented for examination.

Information Disclosure Statement

2. The references listed in the information disclosure statement submitted on 04/16/01 and 04/22/02 have been considered by the examiner (see attached PTO-1449).

Claim Objections

3. Claims 5,9,18,22,31, and 35 are objected to because of the following informalities:

Reference characters corresponding to elements recited in the detailed description and the drawings may be used in conjunction with the recitation of the same element or group of elements in the claims. The reference characters, however, should be enclosed within parentheses so as to avoid confusion with other numbers or characters which may appear in the claims. The use of reference characters is to be considered as having no effect on the scope of the claims. Therefore the examiner would like to suggest to the applicant to remove the parentheses from claims 5,9,18,22,31, and 35.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2133

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
4. Claims **1-39** are rejected under 35 U.S.C. 103(a) as being unpatentable over Schulist et al. (U.S. PN: 6,542,58) in view of Wang (U.S. PN: 6,526,531).

As per claims **1, 14 and 27**, Schulist et al. in figure 3 disclosed an apparatus (receiver) (300) and a method for estimating signal-to-noise rate comprising a turbo decoder (110), SNR (signal to noise rate) adaptation unit (315), a SNR (signal-to-noise) estimator or (SNR processor) (115), a power controller (120) and a reference SNR module (125) (see col. 5, lines 16-33). Schulist et al. teach that SNR (signal quality) value derived from a reference SNR value generated by the reference SNR module (125) and forwarded to the SNR adaptation unit (315) for modifying the reference SNR based on one or more factors including the scaling factor associated with decoder input quality metrics generated by the demodulation unit (105), coding rate, power settings and processing gains then forwarded to the turbo decoder (see col. 5, last paragraph and col. 6, lines 11-20). Furthermore, Schulist et al. teach that a power control loop capable of generating transmit power control commands connected to the SNR adaptation unit,

Art Unit: 2133

the SNR adaptation unit receives and modifies the reference SNR value and the turbo decoder (110) connected to the SNR adaptation unit then decodes the received signal as a function of the decode input metrics and the modified reference SNR value (see col. 3, lines 4-15). Schulist et al. did not **explicitly** teach delimiting an interval with accordance the modified quality metric. **However**, Wang in an analogous art teaches an iterative decoder (turbo decoder) having a maximum number of specified iterations but may terminate or limit the number of iterations under specified conditions and early termination (de-limiting) of decoding may occur prior or after an intermediate iteration threshold M (number) of iterations (see abstract). **Therefore**, it would have been obvious to a person having an ordinary skill in the art at the time the invention was made implement the teachings of Schulist et al. using early termination of decoding under specified conditions that may occur prior to iteration threshold number of iterations or after number of iterations occur as taught by Wang. This **modification** would have been obvious because a person having ordinary skill in the art would have been motivated to in order to achieve a reduction in power consumption and an increase in speed of decoding operation.

As per claims **2, 15 and 28**, Schulist et al. in view of Wang teach all the subject matter claimed in claims 1, 14 and 27 including Schulist et al. teach estimating SNR or signal-to-noise-ratio (see abstract).

As per claims **3, 16 and 29**, Schulist et al. in view of Wang teach all the subject matter claimed in claims 1, 14 and 27 including Schulist et al. teach estimating SNR or signal-to-noise-ratio (signal quality) (see abstract). The prior arts (Schulist et al. and Wang) did not **explicitly** teach estimating a signal quality of a slot (segment). **However**, the method of estimating a slot is known in the art because a slot is a portion of a transmission frame that is sent around a loop and

Art Unit: 2133

commonly practiced by most signal-to-noise ratio (SNR) estimators. **Therefore**, it would have been obvious to a person having an ordinary skill in the art at the time the invention was made to implement a method of estimating a signal quality of a slot in the systems of the prior arts (Schulist et al. and Wang) since by the fact of virtue estimating a signal quality of a slot according to a specified procedure is commonly used by most of SNR estimators. **This modification** would have been obvious because a person having ordinary skill in the art would have been motivated in order to minimize consumption of space processing power.

As per claims **4, 17 and 30**, Schulist et al. in view of Wang teach all the subject matter claimed in claims 1, 14 and 27 including Schulist et al. in figure 2 teach the expected link performance of a receiver, in terms of a bit error rate (BER) an block error rate (BLER) as a function of SNR (signal quality) estimation used in decoding, the received signal (see col. 5, lines 5-24).

As per claim **5-12, 18-25, and 31-38**, Schulist et al. in view of Wang teach all the subject matter claimed in claims 1, 14 and 27 including Schulist et al. teach the SNR adaptation unit (see fig. 3, element 315) employs one of more embedded algorithms to handle the modification of the reference SNR value and these one or more algorithms may be implemented through software, firmware, or a combinations thereof using convolutional tools and programming practices (see col. 6, lines 21-28). Further, Wang teach a turbo decoder (see fig. 3, element 304) decodes the encoded frame with an iterative decoding algorithm including early termination or early delimiting (see col. 5, last paragraph). Schulist et al. in view of Wang did not **explicitly** teach delimiting a quality signal comprising a parameter defining the formula in accordance to a specific formula. **Nevertheless**, as would have been well known to one ordinary skill in the art at

Art Unit: 2133

the time the invention was made, parameters are required in most of programs to define a variable that is given constant value for a specified application. **Accordingly**, it would have been obvious to one ordinary skill in the art to include a parameter in order to name in a procedure that is used to refer to an argument passed to that procedure.

As per claims **13, 26, and 39**, Schulist et al. in view of Wang teach all the subject matter claimed in claims 1, 14 and 27 including Wang teaches an iterative decoder (turbo decoder) having a maximum number of specified iterations but may terminate the number of iterations under specified conditions and early termination of decoding may occur prior or after an intermediate iteration threshold M (number) of iterations (see abstract).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- IEEE, Schurger et al. "Adaptive turbo decoding for indoor wireless communication", 10/02/98.

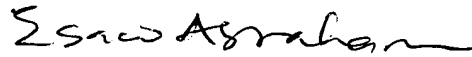
6. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Esaw Abraham whose telephone number is (703) 305-7743. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are successful, the examiner's supervisor, Albert DeCady can be reached on (703) 305-9595. The fax phone numbers for the organization

Art Unit: 2133

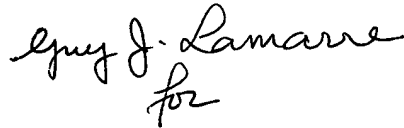
where this application or proceeding is assigned are (703) 746-7239 for regular communications and (703) 746-7238 for after final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.



Esaw Abraham

Art unit: 2133



for
Albert DeCady
Primary Examiner